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ABSTRACT

This module on safety is one of a set of four on stages and structure of curriculum development and is part of a larger series of thirty-four modules comprising a core curriculum intended for use in the professional preparation of vocational educators in the areas of agricultural, business, home economics, and industrial education. Following the module objective and overview and a bibliography of suggested resource materials (readings) for the entire module, five lessons are presented: (1) Occupational Safety and Health Act; (2) housekeeping; (3) fire safety; (4) first aid; and (5) electrical safety. Each lesson contains the objective, overview, a list of suggested learning activities, and a list of suggested resources (readings). Concluding the module are five pre/posttests and answer keys. A school shop safety inspection check list is also included. (The modules have been field tested in various educational settings, including bachelor and masters degree programs, and are considered adaptable to many instructional styles and student entry levels. CE 018 935-937 contain working papers and other materials used in the development of the module series.) (JH)

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Common Core Curriculum
for Vocational Education

F-4

SAFETY

Module Writer: Gary Winegar, D.Ed.

Category F:

STAGES AND STRUCTURE OF CURRICULUM DEVELOPMENT

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1978

CE018 966

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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ABOUT THIS MODULAR CURRICULUM

This module is one of a series of 34 modules intended for use in the professional preparation of vocational educators in the vocational education service areas of agricultural, business, home economics, and industrial education. The curriculum can be adapted to various styles of instruction and to various entry-levels of students.

It is recommended that an instructor planning to use these modules review each category to determine if any modification is needed in the objectives and suggested activities so that they conform with local institutional policies and/or vocational education programs. It is also suggested that resources and activities be identified for the specific entry-level of the student to be served.

The activities listed are suggested. The use of any other activity or reading reference which the instructor believes would help to accomplish the objectives of that lesson is encouraged. The choice of the teacher to use the entire module, either through group reports or individualized assignment, will be related to individual student competency requirements.

Since many modules strongly recommend the use of local administrative personnel and community rsources, it is suggested that all site visitations and requests for assistance in the community be coordinated by or cleared through the instructor. The instructor may wish to distribute these tasks among the student group and across the community with the class report system being used to disseminate the information gathered.

These modules have been field tested in various settings. They have been used with students working toward a bachelor's or master's degree and with students seeking the designated subjects credential in Californica. Some modules were tested through student independent study, others as part of total class assignment, and still others as an alternate activity. Workshop participants examined the materials in terms of content, activities, and resources. The adaptability of this curriculum is one of its strengths.

The materials could not have been completed without the participation and contribution of many individuals. Chief among these persons were the module writers, workshop participants, field-test instructor, and students. Conference presentors and evaluators also contributed to this project. Proceedings of the workshop are available upon request.

If we can provide you with information or help in using this curriculum, please feel free to contact us.

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COMMON CORE CURRICULUM

FOR

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TABLE OF CONTENTS

Module Objective. . . . . Page 1
Module Overview 1
Resource Materials for Completing the Activities in this Module . . . 3
Lesson One: OSHA 4
a. Objective 4
b. Overview. 4
c. Suggested Activities. 4
d. Suggested Resources 5
Lesson Two: Housekeeping 6
a. Objective 6
b. Overview. 6
c. Suggested Activities. 6
d. Suggested Resources 7
Lesson Three: Fire Safety. 8
a. Objective 8
b. Overview. 8
c. Suggested Activities. 8
d. Suggested Resources 9
Lesson Four: First Aid 10
a. Objective 10
b. Overview. 10
c. Suggested Activities. 10
d. Suggested Resources 11
Lesson Five: Electrical Safety 12
a. Objective 12
b. Overview. 12
c. Suggested Activities. 12
d. Suggested Resources 14
Supplementary Material. 15
a. Introduction. 15
b. Directions. 15
Checking Procedures 17
A. General Physical Condition. 17
B. Housekeeping. 18
C. Equipment 19
D. Electrical Installation 20
E. Gas 21
F. Personal Protection 22
G. Instruction 23
H. Accident Records. 24
I. First Aid 24
OSHA Pre/Posttest 25
Housekeeping Pre/Posttest 27
Fire Safety Pre/Posttest. 29
First Aid Pre/Posttest. 30
Electrical Safety Pre/Posttest. 32
Answer Key OSHA Pre/Posttest. 34
Answer Key Housekeeping Pre/Posttest. 36
Answer Key Fire Safety Pre/Posttest 38
Answer Key First Aid Pre/Posttest 40
Answer Key Electrical Safety Pre/Posttest 42

SAFETY

Module Objective

Upon the satisfactory completion of this module, the student preparing to become a teacher of vocational education subjects will be able to analyze and summarize safety as it relates to vocational education in general. In particular, this module is designed to cover three overall objectives:

(1) The vocational student will be able to explain federal and state laws which mandate safe places of employment.

(2) The vocational student will be able to identify unsafe environmental conditions, particularly as they relate to fire, electrical, and housekeeping.

(3) The vocational student will be able to cite first aid emergency procedures to follow in assisting an injured person.

Module Overview

The intent of this module on safety is to cause the vocational student to become more aware of requirements and regulations with which he will be faced in the world of work. Each occupation has specific standards, precautions, and safeguards; therefore, it is not the intent of this module to address itself to any specific vocational area. It is intended, however, to cover those common safety practices related to vocational education in general.

It must be kept in mind that safe practices or conditions, both on and off the job, are equally important to a good safety program. Safety must be thought of as a way of life, not something that is put on and taken off while at work. It has been said that the only way to do something is the safe way.

This module will have more relevance and meaning if vocational students will ask themselves the following questions as they comple the lessons, "Who really loses the most when we are unsafe: do we, our employer, or our families?"

This module has been divided into five lessons.

(1) Occupational Safety and Health Act (OSHA)

(2) Housekeeping

(3) Fire Safety

(4) First Aid

(5) Electrical Safety

Resource Materials for Completing the Activities in this Module

American National Red Cross. Advanced First Aid and Emergency Care. New York: Doubleday and Company, 1973.

American National Red Cross. Standard First Aid and Personal Safety. New York: Doubleday and Company, 1973.

Anderson, Richard C. OSHA and Accident Control Through Training. New York: Industrial Press, 1975.

Corwin, John K. "PMI for Electrical Safety," School Shop. April, 1972, 68-71.

Hafen, Brent Q. and others. First Aid: Contemporary Practices and Principles. Minneapolis, Minnesota: Burgess, 1972.

Hammer, Willie. Occupational Safety Management and Engineering. n Englewood Cliffs, New Jersey: Prentice-Hall, 1976.

Heldreth, Harold E., and Leonard C. Smith. Making Safety Work. New York: McGraw-Hill, 1976.

Johnston, Wallace L. "OSHA What It is and How To Do It," School Shop. February, 1975, 51-55.

Kigin, Denis J. Teacher Liability in School-Shop Accident. Ann Arbor, Michigan: Prakken Publications, 1973.

Koren, Herman. Environmental Health and Safety. New York: Pergamon Press, 1974.

Langdon-Thomas, F. J. Fire Safety in Buildings. New York: St. Martins Press, 1974.

National Fire Protection Association. Flammable Liquids, Gases Volatile Solids 1969. Boston, Massachusetts: National Fire Protection Association, 1969.

"OSHA Checklist." Industrial Education. September, 1975, 41.

Schwersinske, Walter C. "OSHA and Safety Standards in Shops," Industrial Education. December, 1974, 28-29.

State Division of Industrial Safety, Research and Education Unit. California Safety News. 58, Nos. 1, 2, 4 (1974).

Strong, Merle E. (ed.). Accident Prevention Manual. Illinois: American Technical Society, 1975.

Worick, W. Wayne. Safety Education. Englewood Cliffs, New Jersey: Prentice-Hall, 1975.

SAFETY

Lesson One: OSHA

Objective

The vocational student will be able to: (1) give a written explanation of the purpose and the extent of the Occupational Safety and Health Act (OSHA), and (2) assess how OSHA is implemented in business and industry using as example establishments in his/her area of specialty (i.e., agriculture, business, home economics, or industrial education).

Overview

The influence of the Occupational Safety and Health Act (OSHA) ranks third as to the number of people that it affects. It became apparent in the 1960's, with a 29 percent increase in the accident rate, that some action was necessary.

OSHA provides standards for the 50 states. The standards and regulations are primarily a collection of industrial standards and codes that have been in existence in state and federal safety standards for some time and, for the most part, are generally familiar to the journeyman within his/her trade specialty.

Specifically, this lesson is designed to provide an overview of the scope and implication of OSHA.

Suggested Activities

(1) Define the following terms:

a. OSHA and Cal/OSHA

b. Civil and criminal penalties

c. Employer (as defined in OSHA)

d. Inter-state commerce

e. NIOSH

f. General duty clause

g. Abatement

h. NSC

i. Eminent danger

j. Red tag

k. Serious violation

(2) Review the California Occupational Safety and Health Act and determine its effect on business, industry and schools. Discuss findings with a group of peers. Submit to the instructor a written summary of the group discussion.

(3) Explain the differences between and functions of consultants and compliance engineers.

(4) Prepare questions to use in an interview with a local business person affected by the Cal/OSHA. (Select business in your area of interest. Check with instructor before arranging for interview.) Determine his/her reactions to Cal/OSHA and how the regulations were implemented.

Suggested Resources

Anderson, Richard C. OSHA And Accident Control Through Training. New York: Industrial Press, Inc., 1975.

Hammer, Willie. Occupational Safety Management and Engineering. New Jersey: Prentice-Hall, 1976.

Johnston, Wallace L. "OSHA What It Is And How To Do It." School Shop, February 1975, pp. 51-55.

"OSHA Checklist." Industrial Education, September 1975, p. 41.

Schwersinske, Walter C. "OSHA and Safety Standards in Shops." Industrial Education, December 1974, pp. 28 and 29.

State Division of Industrial Safety, Research and Education Unit. California Safety News, Vol. 58, Nos. 1, 2, 4, 1974.

Strong, Merle E., (Ed.). Accident Prevention Manual. Illinois: American Technical Society, 1974.

Worick, W. Wayne. Safety Education. New Jersey: Prentice-Hall, 1975.

Upon successful completion of assigned activities, proceed to Lesson 2.

SAFETY

Lesson Two: Housekeeping

Objective

The vocational student will be able to identify in writing the scope of business/industrial housekeeping as it relates to his/her area of specialty.

Overview

Housekeeping, in the broad sense, means much more than sweeping the floor and dusting the furniture. It often includes an orderly arrangement of tools, equipment, operations, storage facilities, and materials. Fixing stairs, repairing leaks, and replacing or repairing lights are also part of housekeeping. The appearance and the condition of a working facility often contribute to a more positive attitude of workers toward safety.

Sometimes the cost of repairs seems high, but in terms of serious accidents, it is generally only a token of the cost. Businesses are guilty of false economy when they fail to provide a safe working facility.

Suggested Activities

(1) After reading the housekeeping unit in Making Safety Work, explain why the various situations are unsafe and how each of the following should be corrected.

   a. Liquid spills

   b. Freshly waxed floors

   c. Dirty floors

   d. Worn or improperly repaired rugs and doormats or throw rugs not constructed with rubber backing

(2) Prepare a list of housekeeping practices for your area of vocational education that improve safety conditions. Check with students in each of the three other vocational services. Are the lists similar? Different? State a rationale for similarities and/or differences.

(3) Conduct a housekeeping inspection of a typical workplace (school, business, etc.) of your vocational area and write a summary of your findings. Your report might include, but should not be limited to, floors, aisles, equipment, machinery, material, tools, outside grounds,

walls, stairs, and storage closets. You may wish to use a checklist prepared by the National Safety Council or prepare your own. (See checklist in supplementary materials at the end of this module.)

(4) Using the information from the housekeeping survey, write a case study to be used by classmates for analysis and recommendation. File with instructor.

Suggested Resources

Heldreth, Harold E., and Leonard C. Smith. Making Safety Work. New York: McGraw-Hill, 1976.

Koren, Herman. Environmental Health and Safety. New York: Pergamon Press: 1974.

Strong, Merle E. Accident Prevention Manual. Illinois: American Technical Society, 1975.

Upon successful completion of assigned activities, proceed to Lesson 3.

SAFETY

Lesson Three: Fire Safety

Objective

The vocational student will be able to: (1) sketch the fire triangle and explain it in detail; (2) list the three common classifications of fires and the proper extinguishing agents for each, and (3) assess the fire safety practices in a selected work area.

Overview

With a knowledge of the cause and control of fire, one can be more effective by saving time, money, and property to both the employee and employer. In 1971, according to the National Fire Protection Agency (NFPA), there were about 12,000 fatalities in the U. S. as a result of fires. During the same year, property losses totaled over two and three-quarter billion dollars.

The principal causes of fires to buildings, according to a NFPA report are: (1) defective and misuse of electrical wiring and equipment; (2) defective and overheated heating and cooking equipment; and (3) careless use of smoking materials. These three causes accounted for 45 percent of all building fires in 1971.

Fire prevention is viewed from both the humanistic and materialistic points of view; however, the major emphasis in this lesson is on the humanistic or safety of life.

Suggested Activities

(1) Define the following terms:

a. Oxidation

b. Fuel

c. Flash point

d. Spontaneous ignition/combustion

(2) Visit a school facility or place of business and check fire extinguishers, list the various kinds of extinguishers, when they were last serviced, and whether or not they have been tampered with. (Check with your instructor procedures to follow before arranging for selected site visitation.)

(3) Obtain five newspaper articles describing fire damage to persons or to property. Speculate what safety measures might have prevented the fire. How much time was spent in finding five articles?

(4) List the three classifications of fires and the recommended extinguishing agents for each.

(5) Sketch and explain the fire triangle.

(6) After reading the supplementary material in this lesson on fire safety, summarize in one paragraph the exit procedures you would follow, assuming that a fire started on the bottom floor of a five-story building and that you were on the next to the top floor.

Suggested Resources

Hammer, Willie. Occupational Safety Management and Engineering. New Jersey: Prentice-Hall, 1976.

Koren, Herman. Environmental Health and Safety. New York: Pergamon Press, 1974.

Langdon-Thomas, F. J. Fire Safety in Buildings. New York: St. Martins Press, 1973.

National Fire Protection Association. Flammable Liquids, Gases, Volatile Solids 1969. Massachusetts: National Fire Protection Association, 1969.

Strong, Merle E. Accident Prevention Manual. Illinois: American Technical Society, 1975.

Worick, Wayne W. Safety Education: Man, His Machines, and His Environment. New Jersey: Prentice-Hall, 1975.

Upon successful completion of assigned activities, proceed to Lesson 4.

SAFETY

Lesson Four: First Aid

Objective

The vocational student will be able to explain in writing some specific first aid techniques and procedures in giving life support and emergency care to an injured person.

Overview

The knowledge of basic first aid procedures can, in some cases, mean the difference between life and death. Confidence to offer first aid is gained as one acquires basic information and procedures to follow when injuries occur. Sometimes, prompt action is needed to save a life; at other times, there is no need for haste. Efforts in the latter case should be directed toward obtaining assistance, preventing further injury, and reassuring the victim, who is usually emotionally upset.

The primary concerns of this lesson are that vocational students know how to quickly obtain medical assistance and what to do until it is available.

Suggested Activities

(1) Define the following terms:

a. First aid

b. Abrasion

c. Laceration

d. Avulsions

e. Liability

(2) Based upon resources listed and previous class work, explain first aid procedures you would use for the following injuries and give reasons in detail.

a. Electrical shock

b. Asphyxiation or exposure to toxic gas

c. Corrosive burns or cryogenic liquid splashes

d. Fire or imminent danger from collapsing structures or possible exposure

e. Victim not breathing

f. Excessive bleeding

g. Fracture

h. Burns: hot liquid/steam

i. Foreign body on the surface of eyeball or inner surface of eyeball

(3) What is shock, who is it likely to affect, and how is it treated?

(4) What first aid should be given to an unconscious person? Give resource.

(5) What is the emergency "hot line" (fire, serious injury) for your community? What are the results of calling the number?

(6) Explain education code in relation to giving first aid.

(7) Visit a fire station and discuss/observe first aid procedures followed in emergency situations. Write a brief report.

Suggested Resources

American National Red Cross. Advanced First Aid and Emergency Care. New York: Doubleday and Company, 1973.

American National Red Cross. Standard First Aid and Personal Safety. New York: Doubleday and Company, 1973.

California Educational Code.

Hafen, Brent Q. and others. First Aid: Contemporary practices and Principles. Minnesota: Burgess Publishing Company, 1972.

Hammer, Willie. Occupational Safety Management and Engineering. New Jersey: Prentice-Hall, 1976.

Kigin, Denis J. Teacher Liability in School-Shop Accident. Michigan: Prakken Publications, 1973.

Strong, Merle E. (Ed.). Accident Prevention Manual. Illinois: American Technical Society, 1975.

Upon successful completion of assigned activities, proceed to Lesson 5.

SAFETY

Lesson Five: Electrical Safety

Objective

The vocational student will be able to: (1) indicate in writing the physiological effects on the body of a person who has received an electrical shock, and (2) identify at least six unsafe practices concerning the use of electrical equipment or installations.

Overview

Electrical equipment and applicances have become so commonplace that persons often fail to appreciate the hazards involved. Observing safe practices is a lifetime process. Knowledge of safety is essential in preventing personal injury and damage to equipment.

This lesson is designed to provide information as to the effects of electrical hazards. Specific areas of concern include shock and its severity in terms of current/voltage, AC/DC current, and primary and secondary results of an electrical shock, and body reactions to shock. Grounding, ladders, lightning, and fuse boxes are reviewed in terms of unsafe practices.

Suggested Activities

(1) Define the following:

a. Freeze shock

b. Let-go shock

c. Ventricular fibrillation

d. Static electricity

e. Sparks

f. Arcs

(2) Select one of the resources and summarize author's description of:

a. The severity of an electrical shock as it relates to skin conditions

b. The effect of electrical shock on muscles, heart, breathing

c. The primary and secondary effects of an electrical shock

d. A good ground

(3) Indicate the unsafe potential in the following situations:

a. Running an electrical cord under a rug

b. Running a cord in a door jamb

c. Pulling on the cord to remove it from the receptacle (outlet)

d. Handling an electrical appliance while in a bathtub

e. Touching a metal pipe or grounded metal

f. Using lamp sockets to supply current for appliances

(4) Explain the danger involved when using aluminum ladders and irrigation pipe near electrical wires.

(5) Find and analyze three newspaper articles involving electrical shock.

(6) Read Hammer's chapter on electrical safety and list five electrical hazards associated with equipment and outline suggested safety procedures.

(7) During a lightning storm, what knowledge and/or precautions should be taken concerning the following:

a. The behavior of lightning

b. Boating and water

c. Trees

d. Metal building which is grounded and not grounded

(8) Using the safety checklist, prepared by the Joint Safety Committee of American Vocational Association and National Safety Council, as an individual or as a small group activity conduct a safety inspection of a facility associated with your area of vocational education. There will no doubt be sections of the checklist which will not pertain to the facility that you inspect. (See supplementary section for checklist.) Write a brief summary of your findings/concerns/recommendations.

Note: If this activity was sufficiently completed in Lesson Two, Activity No. 3, it should not be duplicated. Consult your instructor before beginning this activity.

Suggested Resources

Corwin, John K. "PMI for Electrical Safety." School Shop, April, 1972, pp. 68-71.

Hammer, Willie. Occupational Safety Management and Engineering. New Jersey: Prentice-Hall, 1976.

Strong, Merle E., (Ed.). Accident Prevention Manual. Illinois: American Technical Society, 1975.

Worick, W. Wayne. Safety Education. New Jersey: Prentice-Hall, 1975.

Upon completion of the assigned activities in this module, you should be ready to take the Module Posttest. See your instructor for directions and measurement criteria.

SAFETY

Supplementary Material

NATIONAL STANDARD SCHOOL SHOP SAFETY INSPECTION CHECK LIST

Prepared by the Joint Safety Committee of the

American Vocational Association - National Safety Council

Introduction

A safe environment is an essential part of the school shop safety education program. The safe environment will exist only if hazards are discovered and corrected through regular and frequent inspections by school personnel — administrators, teachers, and students. Safety inspections are to determine if everything is satisfactory.

Inspections may be made at the request of the board of education, the school administration or upon the initiative of the teacher. Some communities have drawn upon the cooperative service of professional safety engineers, inspectors of state labor departments, insurance companies, and local safety councils to supplement and confirm inspections by school personnel.

Directions

Who Inspects? This will depend upon local policies. It is recommended, however, that shop teachers and students--the student safety engineer and/or student safety committee--participate in making regular inspections. This not only tends to share responsibility but stimulates a broader interest in the maintenance of a safe school shop.

When to Inspect? As a minimum, a safety inspection should be made at the beginning of every school term or semester. More frequent inspections may be advisable.

How to Inspect? Inspections should be well-planned in advance. They should be systematic and thorough. No location that may contain a hazard should be overlooked.

Inspection reports should be clear and concise, but with sufficient explanation to make each recommendation for improvement understandable.

Follow-Up. The current report should be compared with previous records to determine progress. The report should be studied in terms of the accident situation so that special attention can be given to those conditions and locations which are accident producers.

Each unsafe condition should be corrected as soon as possible in accordance with accepted local procedures. A definite policy should be established in regard to taking materials and equipment out of service because of unsafe conditions. The inspection report can be used to advantage as the subject for staff and class discussion.

CHECKING PROCEDURES

Draw a circle around the appropriate letter, using the following scheme:

S - Satisfactory (needs no attention)

A - Acceptable (needs some attention)

U - Unsatisfactory (needs immediate attention)

Recommendations should be made in all cases where a "U" is circled. Space is provded at the end of the form for such comments. Designate the items covered by the recommendations, using the code number applicable (as B-2).

In most categories, space is provided for listing of standards, requirements, or regulations which have local application only.

A. General Physical Condition

1. Machines, benches, and other equipment are arranged so as to conform to good safety practices. . . . . S A U
2. Condition of stairways . . . . . S A U
3. Condition of aisles. . . . . S A U
4. Condition of floors. . . . . S A U
5. Condition of walls, windows, and ceiling . . . . . S A U
6. Illumination is safe, sufficient, and well-placed. . . . S A U
7. Ventilation is adequate & proper for conditions. . . . . S A U
8. Temperature control. . . . . S A U
9. Fire extinguishers are of proper type, adequately supplied, properly located and maintained. . . . . S A U
10. Teacher and pupils know location of and how to use proper type for various fires. . . . . S A U
11. Number and location of exits is adequate and properly identified . . . . . S A U
12. Proper procedures have been formulated for emptying the room of pupils and taking adequate precautions in case of emergencies . . . . . S A U
13. Lockers are inspected regularly for cleanliness and fire hazards . . . . . S A U

14. Locker doors kept closed. . . . . S A U

15. Walls are clear of objects that might fall. . . . . S A U

16. Utility lines are properly identified . . . . . S A U

17. Teachers know the procedure in the event of fire including notification of the fire department and evacuation of building. . . . . S A U

18. Air in shop is free from excessive dust, smoke, etc.. . S A U

19. _____ S A U

20. _____ S A U

21. _____ S A U

22. _____ S A U

23. Evaluation for the total rating of "A. General Physical Condition". . . . . S A U

B. Housekeeping

1. General appearance as to orderliness. . . . . S A U

2. Adequate appearance as to orderliness . . . . . S A U

3. Benches are kept orderly. . . . . S A U

4. Corners are clean and clear . . . . . S A U

5. Special tool racks in orderly condition, and provided at benches and machines . . . . . S A U

6. Tool, supply, and/or material room is orderly . . . . . S A U

7. Sufficient scrap boxes are provided . . . . . S A U

8. Scrap stock is put in scrap boxes promptly. . . . . S A U

9. Materials are stored in an orderly and safe condition . S A U

10. A spring lid metal container is provided for waste and oily rags . . . . . S A U

11. All waste materials and oily rags are promptly placed in the containers . . . . . S A U

12. Containers for oily rags and waste materials are frequently and regularly emptied . . . . . S A U

13. Dangerous materials are stored in metal cabinets. . . . S A U

14. Machines have been color-conditioned. . . . . S A U

15. Safety cans are provided for flammable liquids. . . . . S A U

16. Bulk storage of dangerous materials is provided outside of the main building. . . . . S A U

17. A toe-board or railing around a mezzanine used for storage or washing facilities . . . . . S A U

18. Materials are stored in an orderly and safe condition on this mezzanine . . . . . S A U

19. Flammable liquids are not used for cleaning purposes. . S A U

20. Floors are free of oil, water, and foreign material . . S A U

21. Floors, walls, windows and ceilings are cleaned periodically. . . . . S A U

22. _____ S A U

23. _____ S A U

24. _____ S A U

25. _____ S A U

26. Evaluation for the total rating for "B. Housekeeping". S A U

C. Equipment

1. Machines are arranged so that workers are protected from hazards of other machines, passing students, etc.. S A U

2. Danger zones are properly indicated and guarded . . . . S A U

3. All gears, moving belts, etc., are protected by permanent enclosure guards. . . . . S A U

4. All guards are used as much as possible . . . . . S A U

5. All equipment control switches are easily available to operator. . . . . S A U

6. All machines are "locked off" when instructor is out of room. . . . . S A U

7. Brushes are used for cleaning equipment . . . . . S A U

8. Nonskid areas are provided around machines. . . . . S A U

9. Machines are in safe working condition. . . . . S A U

10. Machines are guarded to comply with American Standards Association and local state code. . . . . S A U

11. Adequate supervision is maintained when students are using machines and dangerous tools. . . . . S A U

12. Tools are kept sharp, clean, and in safe working order. S A U

13. All hoisting devices are in safe operating condition. . S A U

14. Machines are shut off while unattended. . . . . S A U

15. Adequate storage facilities for tools, equipment, etc., not in immediate use. . . . . S A U

16. _____ _____ S A U

17. _____ S A U

18. _____ S A U

19. _____ S A U

20. Evaluation for total rating for "C. Equipment" . . . . S A U

D. Electrical Installation

1. All switches are enclosed . . . . . S A U

2. There is a master control for all of the electrical installations . . . . . S A U

3. Electrical outlets and circuits are properly identified. . . . . S A U

4. All electrical extension cords are in safe condition and are not carrying excessive loads. . . . . S A U

5. All machine switches are within easy reach of operators S A U

6. Electrical motors and equipment are wired to comply with the National Electric Code . . . . . S A U

7. Individual cut-off switches are provided for each machine . . . . . S A U

8. Machines are provided with overload and underload controls by magnetic pushbutton controls. . . . . S A U

9. No temporary wiring in evidence. . . . . S A U

10. _____ S A U

11. _____ S A U

12. _____ S A U

13. _____ S A U

14. Evaluation for total rating for "D. Electrical Installation". . . . . S A U

E. Gas

1. Gas flow to appliances is regulated, so that when appliance valve is turned on full, the flames are not too high . . . . . S A U

2. Gas appliances are properly insulated with asbestos or other insulating material from tables, benches, adjacent walls, or other flammable materials . . . . . S A U

3. No gas hose is used where pipe connections could be made . . . . . S A U

4. Gas appliances have been adjusted so that they may be lighted without undue hazard . . . . . S A U

5. Students have been instructed when lighting gas appliances to light the match first before turning on the gas . . . . . S A U

6. There are no gas leaks, nor is any odor of gas detectable in any part of the shop . . . . . S A U

7. Shop instruction has been given concerning the lighting of gas furnaces operating with both air and gas under pressure . . . . . S A U

8. When lighting the gas forge, goggles are worn. . . . . S A U

9. When lighting the gas furnace, the following procedure is used: (a) light the match; (b) turn on the gas; (c) drop the match in the hole in top of the furnace . S A U

10. In shutting down the gas furnace, the gas valve is closed before the air valve. . . . . S A U

11. _____ S A U

12. _____ S A U

13. _____ S A U

14. _____ S A U

15. Evaluation for total rating for "E. Gas". . . . . S A U

F. Personal Protection

1. Goggles or protective shields are provided and required for all work where eye hazards exist . . . . . S A U

2. If individual goggles are not provided, hoods and goggles are properly disinfected before use. . . . . S A U

3. Shields and goggles are provided for electric welding. S A U

4. Rings and other jewelry are removed by pupils when working in shop. . . . . S A U

5. Proper kind of wearing apparel is worn and worn properly for the job being done . . . . . S A U

6. Leggings, safety shoes, etc., are worn in special classes such as foundry, etc., when needed . . . . . S A U

7. Respirators are provided for dusty or toxic atmospheric conditions such as when spraying in the finishing room S A U

8. Provisions are made for cleaning and sterilizing respirators. . . . . S A U

9. Students are examined for safety knowledge ability . . S A U

10. Sleeves are rolled above elbows when operating machines S A U

11. Clothing of students is free from loose sleeves, flopping ties, loose coats, etc. . . . . S A U

12. _____ S A U

13. _____ S A U

14. _____ S A U

15. _____ S A U

16. Evaluation for total rating for "F. Personal Protection" . . . . . S A U

G. Instruction

1. Shop safety is taught as an integral part of each teaching unit. . . . . S A U
2. Safety rules are posted particularly at each danger station. . . . . S A U
3. Printed safety rules are given each student. . . . . S A U
4. Pupils take a safety pledge. . . . . S A U
5. Use of a safety inspector. . . . . S A U
6. Use of a student shop safety committee . . . . . S A U
7. Use of safety contests . . . . . S A U
8. Motion and/or slide films on safety are used in the instructions . . . . . S A U
9. Use of suggestion box. . . . . S A U
10. Use of safety tests. . . . . S A U
11. Use of safety posters. . . . . S A U
12. Talks on safety are given to the classes by industrial men. . . . . S A U
13. Tours are taken of industrial plants as a means of studying safety practices. . . . . S A U
14. Periodic safety inspections of the shop are made by a student committee. . . . . S A U
15. Men from industry make safety inspection of the shop . S A U
16. Student shop safety committee investigates all accidents. . . . . S A U
17. A proper record is kept of safety instructions which are given, preferably showing the signature of student on tests given in this area. . . . . S A U
18. Rotate students on the Shop Safety Committee so that as many students as possible have an opportunity to participates . . . . . S A U
19. _____ S A U
20. _____ S A U

21. _____ S A U

22. _____ S A U

23. Evaluation for total rating of "G. Instruction" . . . S A U

H. **Accident Records**

1. There is a written statement outlining the proper procedures when and if a student is seriously hurt . . S A U

2. Adequate accident statistics are kept. . . . . S A U

3. Accidents are reported to the proper administrative authority by the instructors . . . . . S A U

4. A copy of each accident report is filed with the State Department of Education. . . . . S A U

5. Accident reports are analyzed for instructional purposes and to furnish the basis for elimination of hazards . . . . . S A U

6. _____ S A U

7. _____ S A U

8. _____ S A U

9. _____ S A U

10. Evaluation for total rating of "H. Accident Records" . S A U

I. First Aid

1. An adequately stocked first aid cabinet is provided . . S A U

2. The first aid is administered by a qualified individual. . . . . S A U

3. The school has individuals qualified to administer first aid . . . . . S A U

4. _____ S A U

5. _____ S A U

6. _____ S A U

7. _____ S A U

8. Evaluation for total rating of "I. First Aid". . . . . S A U

SAFETY

OSHA PRE/POSTTEST

Student_____

Instructor_____

Date_____

Student: This pre/posttest is designed to assess your knowledge of safety and OSHA. Since this module is an individualized competency-based learning device, you will need to study only those lessons that are presented on the basis of your response to this test.

1. What is the purpose of:

   a. Cal/OSHA

   b. NIOSH

   c. NSC

2. Define:

   a. abatement

   b. eminent danger

3. What is the purpose of OSHA?

4. Since the advent of OSHA, explain how a state can regain control of safety over industries within its borders.

OSHA Pre/Posttest (continued)

5. Explain the different functions of consultants and compliance officers under Cal/OSHA.

6. Explain which businesses are affected by OSHA.

SAFETY

HOUSEKEEPING PRE/POSTTEST

Student_____

Instructor_____

Date_____

Student: This pre/posttest is designed to assess your knowledge of safety and housekeeping. Since this module is an individualized competency-based learning device, you will need to study only those lessons that are presented on the basis of your response to this test.

1. Different colors of paint are used to designate safety precautions or to identify safety equipment. What are the following colors used to identify?

   a. Red

   b. Yellow

   c. Green

   d. Yellow strips

   e. Black and yellow checks

   f. Black and white checks or stripes

2. Where and how should flammable liquids be stored? Where should rags containing flammable liquids be disposed?

3. Explain why safe housekeeping is inseparable from fire prevention.

Housekeeping Pre/Posttest (continued)

4. Explain safety factors to consider when purchasing a throw rug.

5. Explain at least two methods of preventing shock from electrical outlets, especially as it relates to small children.

6. Explain the significance of "UL" (Underwriters Laboratories) approval and to what does it apply.

7. Explain which age groups are most vulnerable to highly waxed floors.

SAFETY

FIRE SAFETY PRE/POSTTEST

Student_____

Instructor_____

Date_____

Student:	This pre/posttest is designed to assess your knowledge of fire safety. Since this module is an individualized competency-based learning device, you will need to study only those lessons that are presented on the basis of your response to this test.

1. Define the following terms as they pertain to fire:

   a. Oxidation

   b. Fuel

   c. Flash points

2. Explain what is meant by spontaneous combustion ignition. What are materials that are likely to create spontaneous combustion?

3. List the three general classifications of fires and the recommended extinguishing agents for each.

   a.

   b.

   c.

4. Sketch and explain the fire triangle.

SAFETY

FIRST AID PRE/POSTTEST

Student_____

Instructor_____

Date_____

Student: This pre/posttest is designed to assess your knowledge of first aid. Since this module is an individualized competency-based learning device, you will need to study only those lessons that are presented on the basis of your response to this test.

1. Define the following terms:

   a. First aid

   b. Abrasion

   c. Laceration

   d. Avulsion

   e. Liability

2. Explain the first aid procedures for the following:

   a. Electrical shock

   b. Asphyxiation or exposure to toxic gas

   c. Corrosive burns or cryogenic liquid splashes

   d. Fire or imminent danger from collapsing structures or possible exposure

   e. Victim not breathing

   f. Excessive bleeding

   g. Fracture

First Aid Pre/Posttest (continued)

3. When and how should a tourniquet be used?

4. What is shock, who is likely to be affected, and how is it treated?

5. What first aid should be given to a person who is unconscious?

6. Explain how to remove a foreign body from the surface of the eyeball or from the inner surface of the eyelid.

7. Explain how to remove a piece of food lodged in a person's throat. What is the "Heimlich Maneuver"?

SAFETY

ELECTRICAL SAFETY PRE/POSTTEST

Student_____

Instructor_____

Date_____

Student:	This pre/posttest is designed to assess your knowledge of electrical safety. Since this module is an individualized competency-based learning device, you will need to study only those lessons that are presented on the basis of your response to this test.

1. Explain what could happen to the body as a result of an electrical shock.

2. Identify five variables that determine the severity of electrical shock.

   a.

   b.

   c.

   d.

   e.

3. Compare AC and DC current in terms of shock severity.

Electrical Safety Pre/Posttest (continued)

4. List three characteristics of a good electrical ground wire.

   a.

   b.

   c.

5. Distinguish between primary and secondary injuries of an accident.

6. Explain the kind of ladder to use around electrical power lines.

7. What are the two most common causes of a blown fuse or tripped circuit breaker?

ANSWER KEY
OSHA PRE/POSTTEST

Instructor:	A pre-test has been prepared for each topic. You may wish to give all pre-tests at one time or precede and follow each lesson with pre/posttest. Do not reproduce this page in students' booklets. You must retain it for grading and prescriptive purposes. Answers will vary with individuals. A preferred response might be similar to the answer presented.

1 (L1) a. California OSHA program to take the place of OSHA--Occupational Safety and Health Act.

b. National Institute for Occupational Safety and Health

c. National Safety Council

2. (L1) a. The time given to correct unsafe conditions

b. A situation which could cause serious harm to employees

3. (L1) "To assure, so far as possible, every working man and woman in the nation safe and healthful working conditions and to preserve our human resources."

4. (L1) By submitting to the federal government a safety plan that is as good or better than federal OSHA.

5. (L1) Consultants:

- Train employers and employee groups.
- Prepare safety pamphlets, films, posters, and demonstrations.
- Consult with employers on specific safety problems.
- Will not issue citations.
- Will see that eminent danger is corrected.
- Provide information regarding the interpretation of safety orders.

Compliance Offices:

- Enter places of employment without advance notice in nearly all cases.

OSHA Pre/Posttest Answer Key (continued)

- Ask to see employer or representative.
- Explain purpose of visit.
- Explain the penalty system and general information about the business--size, number of employees, etc.
- Ask for OSHA Log of Occupational Injuries and Illnesses, injury reports, and minutes of safety meetings.
- Conduct a walk-around inspection accompanied by representatives of the employees and employer. They may take pictures, take samples, and take notes.
- Provide a closing discussion of the inspection, including abatement periods and questions on safety regulations.
- Mail citations and a notice of civil penalties to the employer where applicable.

6. (L1) Any business engaged in commerce, which is interpreted to include trade, traffic, commerce, transportation, or communication.

ANSWER KEY
HOUSEKEEPING PRE/POSTTEST

Instructor:	Do not reproduce this page in students' booklets. You must retain it for grading and prescriptive purposes. Answers will vary with individuals. A preferred response might be similar to the answer presented.

1. (L2)
   a. Fire equipment and warning
   b. Caution
   c. First aid
   d. Special attention
   e. Special attention
   f. Traffic markings

2. (L2) In metal containers and in metal cabinets. It is best if they can be stored away from the main building. Rags containing flammable liquid should be disposed of in metal containers.

3. (L2) Rubbish should not be allowed to accumulate on floors, in corners, or other areas. Waste materials should be removed daily. Oil on floors or soaked into wood may catch on fire by a flame, spark, or sufficient heat. Spontaneous combustion is always a threat when rags containing flammable materials are not disposed of properly.

4. (L2) The backing of the rug should be rubberized or specially treated so it will not slip or slide.

5. (L2) One method is to purchase receptacles that require the plug to be twisted before electrical contact is made; hence, the electrical terminals are not accessible with hairpin, etc. Another method is to insert a commercial plug into the receptacle.

6. (L2) The Underwriters Laboratories, Inc. (207 East Ohio Street, Chicago, and 161 Sixth Avenue, New York City) publishes annually a list of manufacturers whose products when tested have proved acceptable under appropriate standards. Devices which have been tested and approved by Underwriters Laboratories are identified by the "UL" label. The organization tests electrical equipment; fire protection equipment

Housekeeping Pre/Posttest Answer Key (continued)

and materials; gas, oil, and miscellaneous appliances; appliances related to accident hazards, automotive equipment, and burglary protection.

7. (L2) Highly waxed floors are particularly hazardous for the young and for the old.

ANSWER KEY
FIRE SAFETY PRE/POSTTEST

Instructor: Do not reproduce this page in students' booklets. You must retain it for grading and prescriptive purposes. Answers will vary with individuals. A preferred response might be similar to the answer presented.

1. (L3)
a. A chemical process which results in high temperature where heat is not able to dissipate.

b. Combustible materials such as wood, rubber, and coal.

c. Temperatures high enough to sustain burning after ignition by an open flame or spark.

2. (L3) Spontaneous ignition is caused as a result of rapid oxidation. Oxidation produces high temperatures which can eventually reach an auto-ignition point.

Spontaneous combustion is a problem with materials such as low-grade coal, unsaturated oils and fats. Organic materials, including cotton, wood shavings, hay and masses of refuse, are also potentially hazardous. Oil is not normally a hazard except when it is in fibrous materials such as cotton rags or wastes.

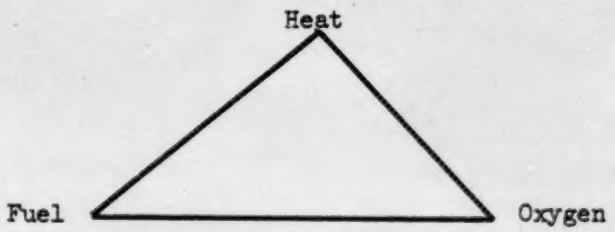
3. (L3)
a. Class "A" fires involve ordinary combustible materials such as wood, paper, and cloth. Recommended extinguishing agent is water.

b. Class "B" fires involve flammable liquids such as gasoline, kerosene, lacquer, oil, grease, varnish, and solvents. Recommended extinguishing agents are foam, carbon dioxide (CO_2), or dry chemicals.

c. Class "C" fires involve electrical equipment such as motors, generators, transformers, switch panels or boxes, and general wiring. Recommended extinguishing agents are carbon dioxide or dry chemicals.

Fire Safety Pre/Posttest Answer Key (continued)

4.
(L3)



The three elements required to produce and to maintain a fire are heat, fuel, and oxygen. This being so, there are also three ways to extinguish a fire: (1) cooling the fuel below its kindling point; (2) excluding the oxygen supply; and (3) separating the fuel from the oxygen.

SAFETY

ANSWER KEY
FIRST AID PRE/POSTTEST

Instructor:	Do not reproduce this page in students' booklets. You must retain it for grading and prescriptive purposes. Answers will vary with individuals. A preferred response might be similar to the answer presented.

1. (L4)
   a. Immediate care given to a person who has been injured or has been suddenly taken ill.
   b. Usually the result of the skin being scraped against a hard surface.
   c. Jagged, irregular, or blunt breaking or tearing of the soft tissue.
   d. Tissue that is forcibly separated or torn from the victim's body.
   e. Legal responsibility; the state of one who is bound in law and justice to do something which may be enforced by action.

2. (L4)
   a. If person is still in contact with electrical current, turn off the power. If power cannot be turned off, remove victim from power source with a wooden pole or a non-conductor device.
   b. Move victim to fresh air or supply oxygen where he/she is.
   c. Wash off substance and flush skin with large amounts of water.
   d. Move victim to a safe area. A person should not be moved when incapacitated unless there is an imminent danger where he/she lies.
   e. Artificial respiration should be given immediately. Mouth-to-mouth or other means of resuscitation with heart massage should be kept up until breathing is restarted or until medical personnel take over.
   f. Use a first aid dressing, clean handkerchief, towel or shirt to apply a compress. It should be applied to the wound with firm pressure.
   g. Care must be taken to prevent making the injury worse and increasing the shock.

First Aid Pre/Posttest Answer Key (continued)

3. (L4) It should only be used as a last resort. If used, it should be placed between the wound and the heart.

4. (L4) What: a condition resulting from a depressed state of many vital body functions.

Who: everyone in an accident suffers from shock to some degree.

How: keep patient warm, quiet, and comfortable by loosening his/her clothes and by removing bulky or heavy items. If there is no head wound or broken leg, the victim's head should be lowered and his legs raised slightly to help increase blood flow to the brain.

5. (L4) If the victim is breathing, he/she should be placed face down with his/her head turned to one side to prevent choking if vomiting occurs. Care should be taken to not obstruct the air passage. Do not give liquid to an unconscious person.

6. (L4) First, check the inner side of the lower lid. If object is found, remove it with clean handkerchief or paper tissue. Check upper eyelid by pulling upper lid over lower lashes.

7. (L4) Food can many times be removed by using the "Heimlich Maneuver." This consists of standing behind a choking victim, quickly grasping both arms around the victim's waist, one hand gripping the other wrist, and then pressing forcefully into the victim's diaphragm just below the ribs. This method compresses the lung and expels the matter choking the victim.

ANSWER KEY
ELECTRICAL SAFETY PRE/POSTTEST

Instructor:	Do not reproduce this page in students' booklets. You must retain it for grading and prescriptive purposes. Answers will vary with individuals. A preferred response might be similar to the answer presented.

1. (L5)
   a. Involuntary contraction of the muscles
   b. Affects or stops the heart
   c. Stop breathing
   d. Causes burns

2. (L5)
   a. The amount of current that flows through the body
   b. The path the current takes through the body
   c. The length of time the victim is in the current
   d. The type of electrical energy in question
   e. The physical condition of the victim

3. (L5) Direct current carries less shock for a given voltage than alternating current. Direct current is likely to burn more severely than alternating current.

4. (L5)
   a. Low in resistance
   b. Large enough to resist mechanical breakage
   c. Carries off the heaviest current flow that might result from any insulation breakdown or other accident

5. (L5)
   Primary: shock, burn, etc.
   Secondary: fall from ladder, scaffold, etc.

Electrical Safety Pre/Posttest Answer Key (continued)

6. (L5) Wooden. Aluminum ladders should not be used near power lines.

7. (L5) A blown fuse usually indicates a short or an overloaded circuit, often caused by using too many extension cords.

MODULES -- COMMON CORE CURRICULUM FOR VOCATIONAL EDUCATION

Category A: Introduction to Vocational Education

- A-1 History, Philosophy, and Trends in Vocational Education
- A-2 Scope, Function, and Organization in Vocational Education
- A-3 Vocational Legislation
- A-4 Assessing the Job Market and Employment Trends

Category B: Cooperative Relationship

- B-1 Rationale for Cooperative Relationships
- B-2 Advisory Councils
- B-3 Cooperative and Work Experience Programs

Caregory C: Vocational Students

- C-1 Promoting Vocational Education and Recruiting Eligible Students for Vocational Education
- C-2 Assessing Students' Personal Characteristics
- C-3 Guidance and Counseling
- C-4 Assisting Students with Special Needs in Vocational Education Program
- C-5 Assessing the Needs of the Disadvantaged Student
- C-6 Developing Student Leadership Qualities in Vocational Education Programs
- C-7 Student Organizations

Category D: Administration and Supervision

- D-1 Fiscal Management of a Vocational Education Program
- D-2 Writing a Vocational Education Project/Budget
- D-3 Record Keeping in Vocational Programs
- D-4 Conference Leadership
- D-5 Selection, Supervision, and Evaluation of Personnel
- D-6 School Law and Its Relationship to Vocational Education
- D-7 Staff Development
- D-8 Implementation of Change

Category E: Curriculum Design in Vocational Education

- E-1 Developing a Curriculum Design in Vocational Education
- E-2 Applying Learning Theory to Vocational Education
- E-3 Instructional Strategies

Category F: Stages and Structure of Curriculum Development

- F-1 Theories in Curriculum Development
- F-2 Building a Curriculum for Vocational Education
- F-3 Applying Curriculum Specifics to Vocational Education
- F-4 Safety

Category G: Evaluation and Research

- G-1 Evaluation Models
- G-2 Evaluation Procedures for Local Programs
- G-3 Introduction to Research Procedures in Vocational Education
- G-4 Research Design in Vocational Education
- G-5 Development of a Research Proposal in Vocational Education